

REMARKS

Applicants have amended claims 13, 37-38, and 43-49, cancelled claim 14 and added new claims 51-53. Support for new claims 51-53 can be found, for example, at page 6, lines 5-9. Accordingly, claims 13 and 15-53 are presented for reconsideration.

Claim Rejections – 35 U.S.C. § 112

The Examiner rejected claims 13-50 under 35 U.S.C. § 112 as being indefinite. Applicant has amended claims 37, 38 and 43 to obviate these rejections. Specifically, applicant has amended the claims to clarify that each micro dichroic filter array includes multiple filter/elements that are each configured to "transmit a portion of an incident light beam, the transmitted portion being a filtered portion, and each filter being further configured to reflect a portion of the incident light beam, the reflected portion being an unfiltered portion." Applicant has further clarified that the polarization of the unfiltered portions of the light beam, i.e., the portions that are reflected by the filter, "is not changed when leaving the display panel."

In view of the amendments, applicant submits that the claims are not indefinite and asks that the rejection of claims 13-50 be withdrawn.

Claim Rejections - 35 U.S.C. § 103

Rejections in view of Ishii

Claims 13-18, 20-24, 33, 35-37, and 43-50 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,552,840 ("Ishii") in view of U.S. Patent No. 5,612,814 ("Yang") alone, or further in combination with U.S. Patent No. 6,280,034 ("Brennesholtz"). Applicants traverse for at least the following reasons.

As amended, these claims cover systems or methods involving first and second liquid crystal on silicon (LCoS) display panels each "comprising a micro dichroic filter array, each micro dichroic filter array including multiple elements configured to transmit a portion of an incident light beam, the transmitted portion being a filtered portion where the filtered portion from different elements are different colors, and each element being further configured to reflect

a portion of the incident light beam, the reflected portion being an unfiltered portion of the light beam, so that the polarization of the unfiltered portion is not changed when leaving the display panel.”

The Office action acknowledges that Ishii does not teach a "dichroic filter as the filter means" and refers to Yang for the teaching of dichroic color filter means. Apparently, the Examiner likens the MxN pixel filters 220 disclosed by Yang to a micro dichroic filter array (Office Action, page 3). However, the pixel filters disclosed by Yang do not “transmit a portion of an incident light beam [and]... reflect a portion of the incident light beam, the reflected portion being an unfiltered portion of the light beam, so that the polarization of the unfiltered portion is not changed when leaving the display panel.”

Nowhere does Yang disclose that the pixel filters reflect an unfiltered portion of the incident light. Rather, Yang states “[e]ach of the pixel filters is capable of *transmitting* only one of the primary light beams onto each of the actuated mirrors 230” (Yang, col. 4, lines 60-62). Yang is silent regarding the light that is not transmitted. However, as would have been understood by a person having ordinary skill in the art, Yang’s filters must absorb light that is not transmitted because Yang’s system operates to modulate the illumination by using actuated mirrors 230 to change the optical path of the light (*id.*, lines 33-36). In other words, Yang’s system creates an image by reflecting light from some pixels out to projection screen 90, while deflecting light from other pixels away from the light path out to projection screen 90. Accordingly, any light reflected from Yang’s pixel filters would be directed out to projection screen 90, degrading the system’s image.

Therefore, neither Ishii nor Yang disclose systems or methods that includes micro dichroic filter arrays as required by the claims.

Even assuming, *arguendo*, that Yang did disclose such micro dichroic filter arrays, the proposed combination with Ishii would still not result in a system or method that included display panels comprising micro dichroic filter arrays arranged “*so that the polarization of the unfiltered portion is not changed when leaving the display panel.*”

To the extent Ishii discloses a system that includes a filter array, it is an array of absorptive filters positioned adjacent a silicon substrate (Ishii, col. 13, lines 46-65, Fig. 7). Accordingly, as would have been understood by a person having ordinary skill in the art, light reflected from a micro dichroic filter array element positioned where Ishii's filters are would not necessarily leave the display panel with its polarization state unchanged because this "unfiltered" light, like the "filtered" portions of the light, would traverse liquid crystal layer 92.

Moreover, modifying Ishii's system to include a micro dichroic filter array would render Ishii's system unsatisfactory for its intended purpose. Specifically, substituting a dichroic filter array for Ishii's filter would result in a display that reflects light of all primary colors from each pixel, instead of light of a single primary color as intended by Ishii. Accordingly, the modification suggested by the Examiner would result in a monochromatic display, not a color display as disclosed by Ishii.

According to the Office, it would have been obvious "to place such [i.e., Yang's] color filters at any position between the entrance to the display panels and the particular modulating elements because such a structure would operate in alike manner" and "to form the filter elements integrally with the panels so as to be a part of the panels themselves because such an integral display panel eliminates the necessity for aligned of optical elements and simplifies the structure." (Emphasis added.)

However, the Office provides absolutely no basis for these conclusions. Moreover, the rationale advanced by the Office simply does not make sense. The filter array disclosed by Ishii is part of the display panel already, so there would be no additional benefit of eliminating "the necessity for aligned of optical elements and simplifies the structure," as alleged by the Office. In fact, as would have been appreciated by a person having ordinary skill, moving the filter array from its position in Ishii's display would, if anything, complicate the manufacturing process because it would involve additional patterning of filter elements on the glass substrate and subsequent alignment of the filter array on the glass substrate with the electrodes on the silicon substrate.

Furthermore, replacing the absorptive filters in Ishii with filter elements that reflect unfiltered light as required by the claims would result in introducing unfiltered light into Ishii's optical system, whereas in Ishii's system this light is absorbed by the filters. As would have been understood by a person having ordinary skill, reflected unfiltered light that remains in the projection system could result in degrading the projection system's image. For at least these reasons, it would not have been obvious to a person having ordinary skill in the art to modify the system disclosed by Ishii in a manner suggested by the Office.

Brennesholtz does not cure Ishii's or Yang's infirmities with respect to the claims.

In summary, neither Ishii, Yang, nor Brennesholtz, either alone or in combination, disclose or render obvious a system or method that include all the limitations set forth in claims 13-18, 20-24, 33, 35-37, and 43-50. Applicants submit that claims 13-18, 20-24, 33, 35-37, and 43-50 are patentable over Ishii, Yang, and Brennesholtz and ask that the rejection of these claims under 35 U.S.C. §103(a) be withdrawn.

Rejections in view Fulkerson

Claims 37-43, 45-46, 48-50, 13-16, 19, 23, 25-34, and 36 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,490,087 ("Fulkerson") in view of Yang alone, or further in view of U.S. Patent No. 6,857,747 ("Pentico"). Applicants traverse.

Like the rejections in view of Ishii, the Examiner admits that Fulkerson does not disclose a micro dichroic filter array and relies on Yang to provide this missing element. However, as explained above, Yang does not disclose a micro dichroic filter array where the elements "transmit a portion of an incident light beam ... [and] reflect a portion of the incident light beam, the reflected portion being an unfiltered portion of the light beam, so that the polarization of the unfiltered portion is not changed when leaving the display panel," as required by the rejected claims.

Moreover, even assuming *arguendo*, that Yang did disclose a micro dichroic filter array, it would not have been obvious to a person having ordinary skill in the art to modify the systems

disclosed by Fulkerson because such modification would change the principle of operation of Fulkerson's systems.

Fulkerson discloses color projection displays that utilize either a color wheel (Fulkerson, FIG. 2) or a "dichroic prism 38" (id., col. 5, lines 55-63). Further, Fulkerson discloses that a "thin film [color] filter can be used in front of each of the blue and red LCD panels to clean up any residual light of the wrong color which gets through the dichroic diagonal of dichroic prism 38." (id., FIG. 10 and col. 9, lines 1-31.) None of these systems utilize a filter *array* at all, nor would it have been obvious to a person having ordinary skill how to modify Fulkerson's systems to include a filter array.

Furthermore, as would have been understood by a person having ordinary skill in the art, utilizing a micro dichroic filter array, one would use an optical component that is more complex, and therefore likely more expensive, than the single dichroic filters disclosed by Fulkerson, defeating stated objectives of Fulkerson's – to provide optical systems that are "mechanically simple" and "minimize[] the use of expensive optical components" (id., col. 2, lines 11-21).

Pentico does not cure Fulkerson's or Yang's deficiencies with respect to the rejected claims.

In summary, neither Fulkerson, Yang, nor Pentico, either alone or in combination, disclose or render obvious a system or method that include all the limitations set forth in claims 37-43, 45-46, 48-50, 13-16, 19, 23, 25-34, and 36. Accordingly, applicants submit that claims 37-43, 45-46, 48-50, 13-16, 19, 23, 25-34, and 36 are patentable over Fulkerson, Yang, and Pentico and ask that the rejection of these claims under 35 U.S.C. §103(a) be withdrawn.

Patentability of new claims 51-53

None of the cited references discloses or suggests a "light recycle system for resubmitting the unfiltered portions of the first and second light beams into the system." Applicants submit that new claims 51-53 are in condition for allowance, which action is requested.

Conclusion

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Applicants submit that all claims are in condition for allowance, which action is requested. Please apply the excess claims fee and any other charges or credits to Deposit Account No. 06-1050. The fee for the Two Month Extension of Time of \$230 is being filed concurrently with the Electronic Filing System (EFS). Please apply any charges or credits to deposit account 06-1050, referencing Attorney Docket No. 17707-002US1.

Respectfully submitted,

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